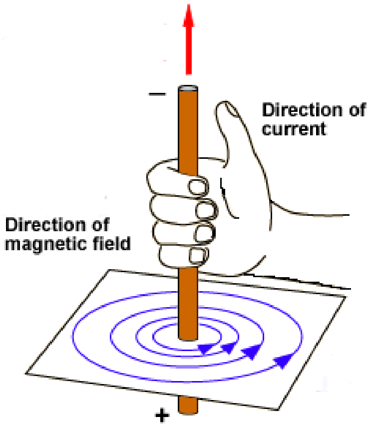
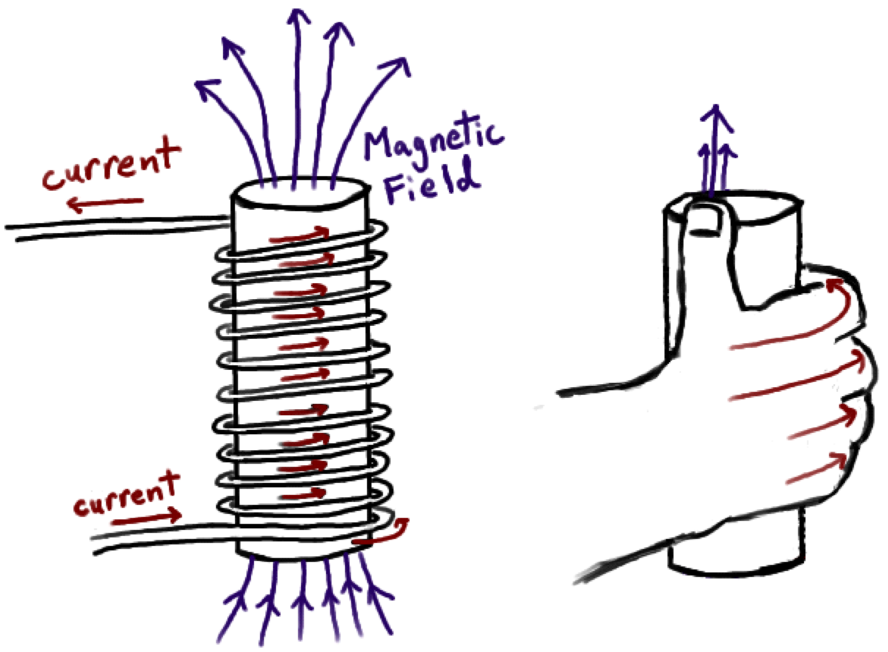
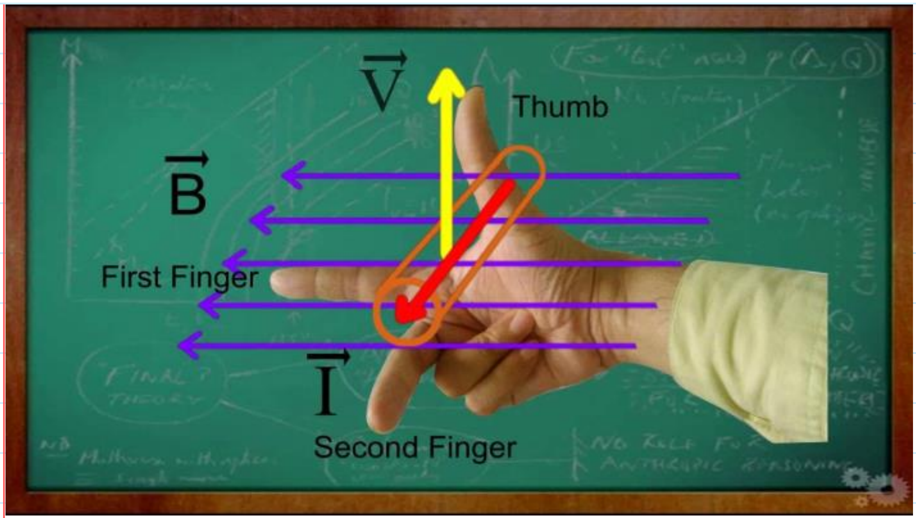
Monday, March 05, 2018 1:32 PM

Test Review

Magnetism 3 right hand rules:







$F_B = IXBL = BIL\sin\theta$

$F_B = vXBq = qvB\sin\theta$

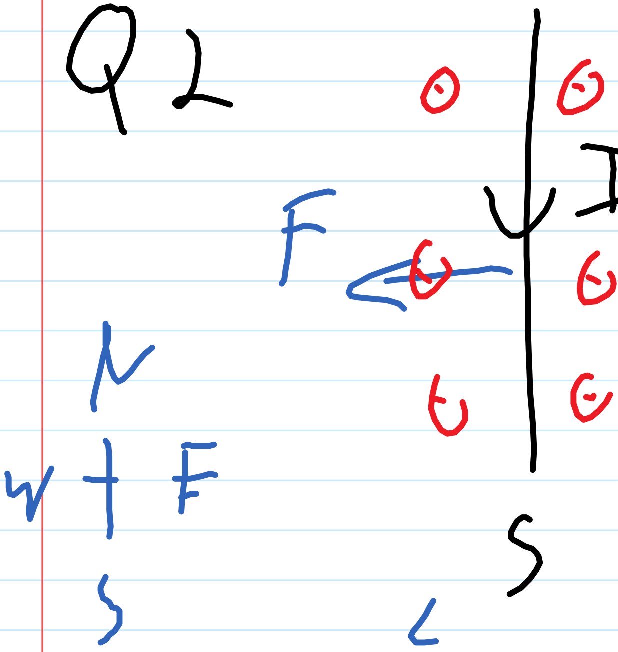
$F_B = F_c$ circular or spiral paths

$qvB = mv^2/r = m4\pi r/T^2$

Q 1 $F = qvB = m\frac{v^2}{r}$

$B = \frac{mv}{qr} = 0.17\,T$

Q2

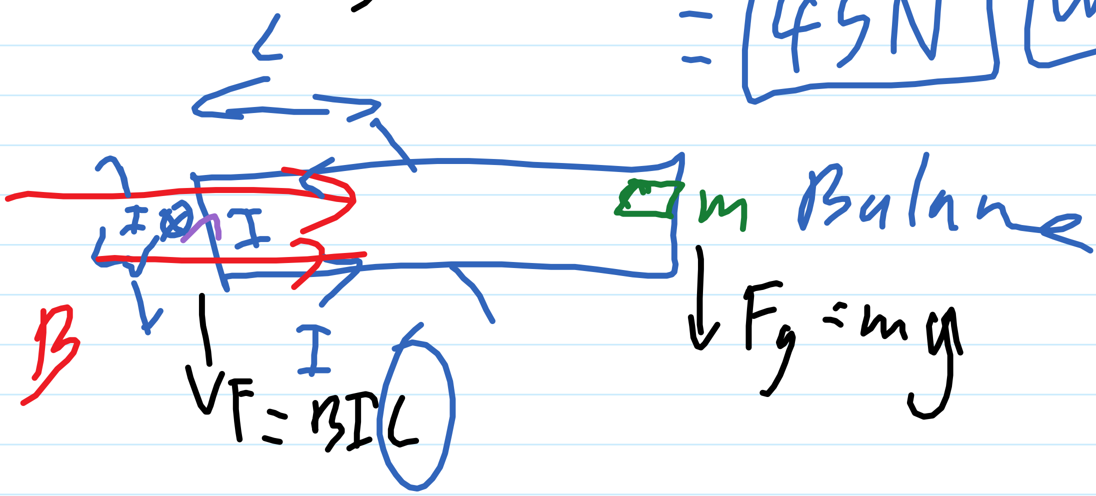


$B = 1.5 \frac{N}{Am} = T$

$F = BIL$

$= 1.5 \times 25 \times 1.2$

$= 45N$ West



$\tau = Fr\sin\theta$

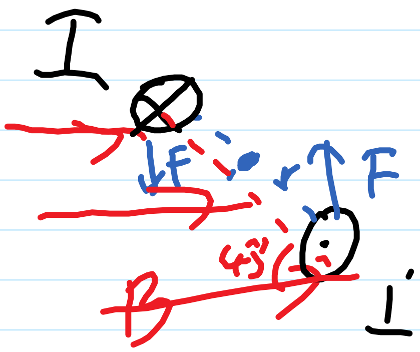
$N \times BIL \times r\sin\theta$

$= 80 \times 0.05 \times 0.02 \times 0.06 \; (2 \times 0.03)$

$\sin 45°$

$= 20 \times 10^{-4}\ Nm$

2 wires



100105

80x0.05x0.02x0.06x(2x0.03)
xSin(45)=
0.000203646752981726

5a) $1/2\ mv^2 = Ve$

b) $W=Fd\cos\theta$ = change in energy
No - the force is always perpendicular to the v so W=0

c) Ek is constant - you can't use B field to speed up a particle - they use it to direct the particles

d) circular motion (if v is not perpendicular to the field, the motion will be spiral or linear if it is parallel to B)

e) $eV=1/2mv^2$ $evB=mv^2/R$

$v = \sqrt{(2eV/m)}$

$eB = m\ \sqrt{(2eV/m)}\ /R$

$e^2B^2=m^2\ 2eV/mR^2$

$eB^2 = m\ 2V/R^2$

$B^2 = m/e\ 2V/R^2$

$m/e = B^2R^2/2V$

6a) 7.06×10^5 m/s

b) 9.2×10^{-3} m

7) 3.2×10^4 N/C

8) 20º